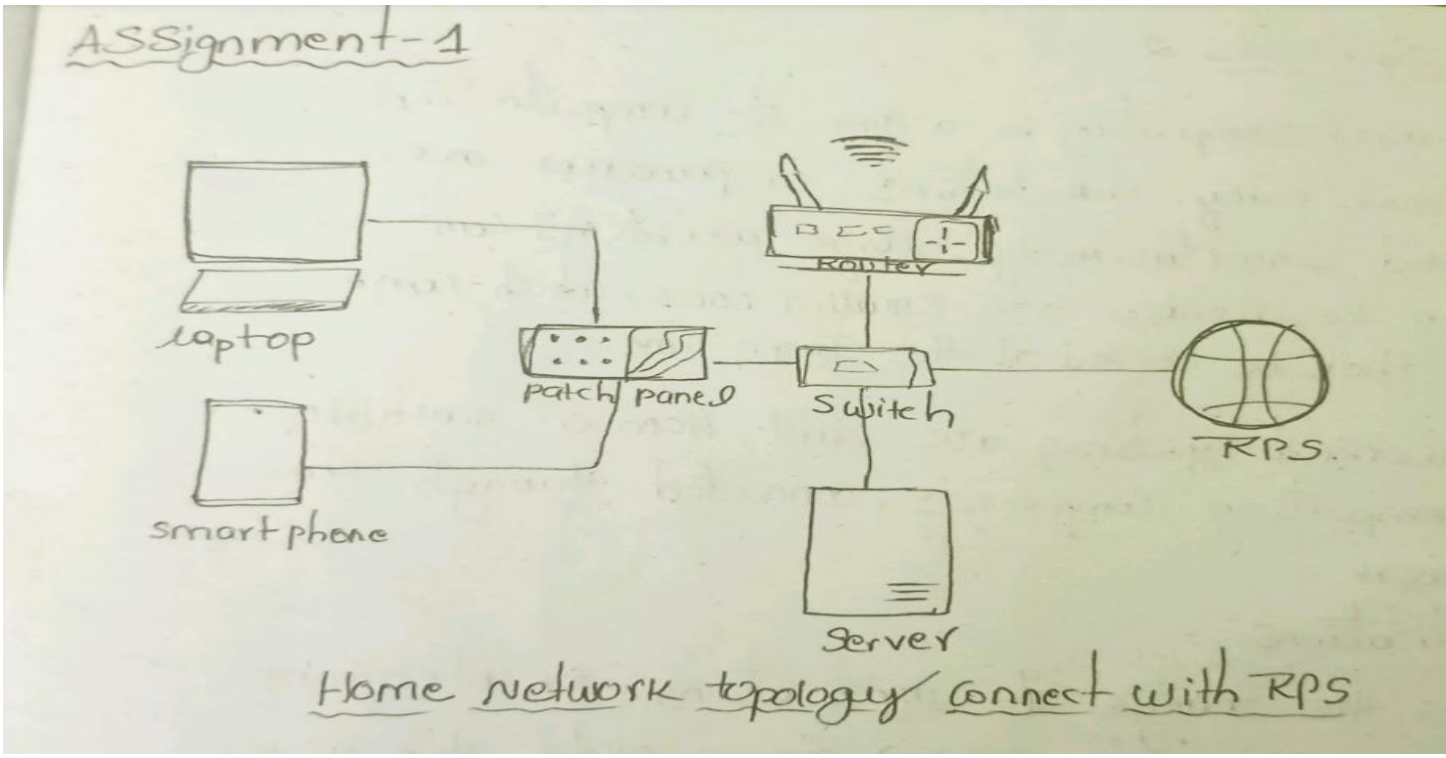
DAY-1

Assignment 1: Draw your Home Network Topology and explain how you are accessing the RPS Lab environment.



Assignment 2 : Iden fy a real-world applica on for both parallel compu ng and networked systems.

Explain how these technologies are used and why they are important in that context.

Answer:

A real-world applica on that u lizes both parallel compu ng and networked systems is weather forecas ng.

Parallel Compu ng:

Weather forecas ng involves complex mathema cal models that simulate the behavior of the atmosphere. These models require significant computa onal power to process vast amounts of data, perform simula ons, and generate predic ons. Parallel compu ng allows weather forecas ng centers to distribute these computa onal tasks across mul ple processors or computers, enabling them to run simula ons faster and more efficiently.

In parallel compu ng for weather forecas ng, tasks such as data preprocessing, numerical simula ons, and post-processing of results can be divided into smaller subtasks that can be executed simultaneously on different processing units. This paralleliza on speeds up the overall computa on me, allowing meteorologists to generate forecasts in a mely manner.

Networked Systems:

forecas ng centers o en rely on a networked system to gather data from various sources, such as weather sta ons, satellites, radar systems, and buoys, distributed across different geographical loca ons. These data sources con nuously collect observa ons of temperature, humidity, wind speed, atmospheric pressure, and other relevant parameters.

A networked system aggregates these observa ons and transmits them to central forecas ng centers for analysis and model ini aliza on. Addi onally, forecast models may be run on distributed compu ng clusters connected through a network to leverage computa onal resources efficiently.

Importance:

Accuracy and Timeliness: Parallel compu ng allows weather models to run faster, enabling meteorologists to generate forecasts with higher spa al and temporal resolu on. This leads to more accurate predic ons, crucial for making informed decisions in various sectors such as agriculture, avia on, disaster management, and public safety.

Scalability: As computa onal demands for weather forecas ng increase with the need for higher resolu on and longer-range predic ons, parallel compu ng provides scalability by allowing forecas ng centers to add more processing units or compu ng nodes to handle larger workloads.

Resilience: Networked systems ensure redundancy and resilience in data collec on and processing. Mul ple data sources and redundant communica on links help mi gate the risk of data loss due to hardware failures or network outages, ensuring the reliability of weather forecasts.

Global Collabora on: Networked systems enable collabora on among meteorological agencies worldwide by facilita ng the exchange of observa onal data, forecast models, and exper se. This global collabora on enhances the quality and coverage of weather forecasts, benefi ng regions that lack adequate observa onal infrastructure.

In summary, the integra on of parallel compu ng and networked systems in weather forecas ng improves forecast accuracy, meliness, scalability, resilience, and global collabora on, making it a cri cal applica on where these technologies are indispensable.